

Application No. 10/056,845  
Amendment dated December 8, 2005  
Reply to Office Action dated September 14, 2005

### **AMENDMENT TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application:

#### **Listing of Claims:**

1. (Currently Amended) A low-temperature oxidation-reduction catalyst comprising:  
a noble metal selected from the group consisting of platinum, palladium, gold, silver and rhodium;  
a mixed-metal oxide layer comprising:  
a first metal oxide which possesses more than one stable oxidation state  
[including at least] consisting of tin oxide;  
a second metal oxide [including at least] consisting of zirconium oxide;  
a third metal oxide selected from the group consisting of cerium oxide, hafnium oxide, lanthanum oxide, and ruthenium oxide; and  
said first, second and third metal oxide each being an active catalytic component of said mixed-metal oxide layer; and  
wherein said first metal oxide, second metal oxide, and third metal oxide have a mass ratio of about 1.0: 0.5: 0.5.
2. (Cancelled)
3. (Previously Presented) A low-temperature oxidation-reduction catalyst of claim 1, wherein said third metal oxide is cerium oxide.
4. (Cancelled)
5. (Previously Presented) A low-temperature oxidation-reduction catalyst of claim 1, further comprising a promoter selected from the group consisting of oxides of the metals of the transition series of the periodic table of elements, wherein the promoter is present in an amount sufficient to provide from about 1 to about 12 atom percent of promoter metal to tin metal.
6. (Previously Presented) A low-temperature oxidation-reduction catalyst of claim 1, wherein said noble metal is from about 1 to about 50 weight percent, based on the total weight of the catalyst; and the first and second metal oxide are collectively from about 50 to about 99 weight percent, based on the total weight of the catalyst.
7. (Previously Presented) A low-temperature oxidation-reduction catalyst of claim 1, for use in the oxidation of carbon monoxide.

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8. (Previously Presented) A low-temperature oxidation-reduction catalyst of claim 1 for use in the oxidation of formaldehyde.
9. (Previously Presented) A low-temperature oxidation-reduction catalyst of claim 1 for use in the oxidation of volatile organic compounds.
10. (Previously Presented) A low-temperature oxidation-reduction catalyst of claim 9, wherein the volatile organic compounds are hydrocarbons.
11. (Previously Presented) A low-temperature oxidation-reduction catalyst of claim 1 for use in the reduction of nitrogen oxide species.

12-16 (Cancelled)

17. (Newly Presented) A low-temperature oxidation-reduction catalyst comprising:  
a noble metal selected from the group consisting of platinum, palladium, gold, silver and rhodium;  
a mixed-metal oxide layer comprising:  
a first metal oxide which possesses more than one stable oxidation state consisting of tin oxide;  
a second metal oxide consisting of zirconium oxide;  
a third metal oxide selected from the group consisting of cerium oxide, hafnium oxide, lanthanum oxide, and ruthenium oxide; and  
said first, second and third metal oxide each being an active catalytic component of said mixed-metal oxide layer; and  
wherein said noble metal is from about 1 to about 50 weight percent, based on the total weight of the catalyst; and the first and second metal oxide are collectively from about 50 to about 99 weight percent, based on the total weight of the catalyst.

18. (Newly Presented) A low-temperature oxidation-reduction catalyst of claim 17, wherein said third metal oxide is cerium oxide.

19. (Newly Presented) A low-temperature oxidation-reduction catalyst of claim 17, wherein said first metal oxide, second metal oxide, and third metal oxide have a mass ratio of about 1.0: 0.5: 0.5.

20. (Newly Presented) A low-temperature oxidation-reduction catalyst of claim 17, further comprising a promoter selected from the group consisting of oxides of the metals of the transition series of the periodic table of elements, wherein the promoter is present in an amount sufficient to provide from about 1 to about 12 atom percent of promoter metal to tin metal.

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21. (Newly Presented) A low-temperature oxidation-reduction catalyst of claim 17, for use in the oxidation of carbon monoxide.
22. (Newly Presented) A low-temperature oxidation-reduction catalyst of claim 17 for use in the oxidation of formaldehyde.
23. (Newly Presented) A low-temperature oxidation-reduction catalyst of claim 17 for use in the oxidation of volatile organic compounds.
24. (Newly Presented) A low-temperature oxidation-reduction catalyst of claim 23, wherein the volatile organic compounds are hydrocarbons.
25. (Newly Presented) A low-temperature oxidation-reduction catalyst of claim 17 for use in the reduction of nitrogen oxide species.

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### **SUBSTANCE OF TELEPHONE INTERVIEW WITH EXAMINER**

A telephone interview between Examiner Nguyen and Counsel for the Applicants, with the assistance of inventor David Schryer, was held on August 17, 2005. Following is a complete and proper recollection of the substance of the interview, in accordance with MPEP 713.04.

#### *(A) Brief Description of the Nature of Any Exhibit Shown or Any Demonstration Conducted*

A proposed draft second supplemental amendment was faxed to the Examiner prior to the interview.

#### *(B) Identification of the Claims Discussed*

Under the Final Office Action dated February 9, 2005, all 11 claims were rejected, therefore, essentially all of these claims were discussed, with specific emphasis being placed on independent Claim 1.

#### *(C) Identification of Specific Prior Art Discussed*

U.S. Patent 6,495,487 B1 (the "Bogdan reference") was the prior art discussed.

#### *(D) Identification of the Principal Proposed Amendments of a Substantive Nature Discussed*

The proposed amendments were set forth in a draft supplemental amendment which was submitted to the Examiner prior to the interview. Proposed amended Claim 1 was primarily discussed, and this amendment read:

1. A low-temperature oxidation-reduction catalyst comprising:
  - a noble metal selected from the group consisting of platinum, palladium, gold, silver and rhodium;
  - a mixed-metal oxide layer comprising:
    - a first metal oxide which possesses more than one stable oxidation state including at least tin oxide;
    - a second metal oxide including at least zirconium oxide;

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a third metal oxide selected from the group consisting of cerium oxide, hafnium oxide, lanthanum oxide, and ruthenium oxide; and  
said first, second and third metal oxide each being an active catalytic component of said mixed-metal oxide layer.

*(E) A Brief Identification of the General Thrust of the Principal Arguments of the Applicant and the Examiner*

The Applicants argued that the proposed claims fully distinguished from the Bogdan reference because the Bogdan reference does not disclose "the recited mixed-metal oxide layer comprising at least tin oxide, zirconium oxide and a third metal oxide selected from the group consisting of cerium oxide, hafnium oxide, lanthanum oxide, and ruthenium oxide, and wherein said first, second and third metal oxide each is an active catalytic component of said mixed-metal oxide layer. Unlike the present invention, the Bogdan catalyst does not use zirconia as an active component. Rather the Bogdan catalyst utilizes zirconia as a refractory inorganic oxide support" (please see the entered August 18, 2005 supplemental amendment for complete argument which had been initially presented in the draft supplemental amendment).

The Examiner did not argue against this interpretation, but rather indicated that another art search would be conducted.

*(F) General Indication of Any Other Pertinent Matters Discussed*

No other pertinent matters were discussed.

*(G) General Results or Outcome of the Interview*

The Examiner indicated that an updated search would be done.

*(H) For Interviews via Electronic Mail, a Paper Copy of E-Mail Contents*

As the interview was not conducted via electronic mail, no e-mail communication occurred.